



Spectral Gamma-Ray Borehole
Log Data Report

Page 1 of 3

Borehole

20-02-11

Log Event A

Borehole Information

Farm : <u>B</u>	Tank : <u>B-102</u>	Site Number : <u>299-E33-183</u>
N-Coord : <u>45,378</u>	W-Coord : <u>52,573</u>	TOC Elevation : <u>652.39</u>
Water Level, ft :	Date Drilled : <u>2/28/1972</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

Borehole 20-02-11 was drilled in February 1972. The borehole was completed at a depth of 100 ft with 6-in. casing.

The casing thickness is presumed to be 0.280 in., on the basis of the published thickness of the schedule-40, 6-in. steel pipe.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1997</u>	Calibration Reference : <u>GJO-HAN-14</u>	Logging Procedure : <u>P-GJPO-1783</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>09/17/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>98.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>8.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>09/18/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>9.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>R</u> Shield : <u>N</u>
Finish Depth, ft. : <u>0.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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Logging Operation Notes:

This borehole was logged by the SGLS in two log runs. The total logging depth achieved was 98.5 ft.

The top of the casing, which is the zero reference for the SGLS, is approximately even with the ground surface. The present measured depth of the borehole is 98.9 ft.

Analysis Information

Analyst : H.D. Mac Lean

Data Processing Reference : MAC-VZCP-1.7.9

Analysis Date : 04/24/1998

Analysis Notes :

The pre- and post-survey field verification spectra for all logging runs met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A casing correction factor for a 0.280-in.-thick steel casing was applied to the concentration data during the analysis process.

Shape factor analysis was applied to the SGLS data. Shape factor parameters can provide insights into the distribution of Cs-137 contamination and into the nature of zones of elevated total count gamma-ray activity not attributable to gamma-emitting radionuclides.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A plot showing selected historical gross gamma-ray logs acquired between 1975 and 1992 is included. These logs show the changes in the gross gamma-ray activity levels at specific depth regions over time.

A plot of the shape factor analysis results is also included. The plot is used as an interpretive tool to help determine the radial distribution of man-made contaminants around the borehole.

Results/Interpretations:

A zone of very high dead time occurred from 5 to 7.5 ft. As a result, no usable spectral data were collected along this region of the borehole.



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Page 3 of 3

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The man-made radionuclide Cs-137 was detected in this borehole. The Cs-137 contamination was measured continuously from the ground surface to a depth of 4.5 ft and from 8 to 25.5 ft. Isolated occurrences of Cs-137 contamination were detected from 28.5 to 29 ft, at 33 ft, and from 98 to 98.5 ft (bottom of the logged interval).

The K-40 concentration values increase from a background of about 12 pCi/g above 39 ft to a background of 15 to 16 pCi/g from 39.5 to 85 ft. The K-40 concentrations increase again below 85 ft and remain at this general level to the bottom of the borehole (98.5 ft).

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank B-102.